

THE SILPHIDAE OF THE PHILIPPINE ISLANDS

(COLEOPTERA)

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In general, the family Silphidae is restricted to the Holarctic Region. Some forms are found in the tropical portions of the globe, but there are few records of silphids from the Philippine Islands. Hatch's catalogue (1928, *Coleopterorum Catalogus*, pars 95) lists two species as occurring on these islands, one of which is herein considered a synonym of the other.

The present paper summarizes the species of Philippine Silphidae based on specimens in the collections of the United States National Museum and the Chicago Natural History Museum. Four species representing three genera are here recorded: (1) a previously known Philippine species which was referred to under two names; (2) a new record of an old, known species; (3) a species which I described in a previous paper in this journal; and (4) a new species.

Oiceoptoma Leach, 1815

The group of brilliantly colored *Oiceoptoma* which Portevin separates under the name *Chrysoilpha* contains four species, of which the present species is restricted to the Philippine Islands. The other three are known from Indo-China, Malaya, and the Celebes.

(1) **Oiceoptoma (Thanatophilus) viridis** Motschulsky

Oiceoptoma viridis Motschulsky, 1861, *Bul. Soc. Nat. de Moscou*, vol. 34, pt. 2, p. 628 [type locality: Philippine Islands].

Eusilpha (Calosilpha) viridis (Motschulsky); Portevin, 1920, *Bul. Mus. d'Hist. Nat.*, Paris, vol. 26, p. 398 [Philippine Islands].

Chrysoilpha viridis (Motschulsky); Portevin, 1921, *l. c.*, vol. 27, p. 538; 1926, *Encycl. Ent.*, vol. 6, p. 108, fig. 92 [Philippine Islands].

Silpha (Chrysoilpha) viridis (Motschulsky); Hatch, 1928, *Coleopterorum Cat.*, pars 95, p. 112 [Philippine Islands].

Silpha coelestis Dohrn, 1875, *Stettin. Ent. Ztg.*, vol. 36, p. 81 [type locality: Philippine Islands]. New synonymy.

Eusilpha (Calosilpha) coelestis (Dohrn); Portevin, 1920, *Bul. Mus. d'Hist. Nat.*, Paris, vol. 26, p. 398 [Philippine Islands].

Chrysoilpha coelestis (Dohrn); Portevin, 1921, *l. c.*, vol. 27, p. 538.

Chrysoilpha caelestis (Dohrn) [sic.]; Portevin, 1926, *Encycl. Ent.*, vol. 6, p. 108, fig. 92 [Philippine Islands].

Silpha superba Kraatz, 1876, *Deut. Ent. Ztschr.*, vol. 20, p. 374 [type locality: Luzon, Philippine Islands].

Silpha superba Kraatz; Arrow, 1909, *Ann. and Mag. Nat. Hist.*, ser. 8, vol. 4, p. 190. Placed as synonym of *Silpha coelestis* Dohrn, 1875.

Location of types.—*Oiceoptoma viridis*: Motschulsky says that he saw this species in Thorey's collection which was later given to Oberthür (Rennes). The Oberthür collection in turn went to the Paris Museum. It is thus presumed that if the type is in existence, it is in that Museum. *Silpha coelestis* Dohrn and *Silpha superba* Kraatz: Location of types unknown to the author.

Diagnostic features.—Head rectangular, three-fourths as broad as long, slightly longer in males than females; frontal carina between the eyes obscure. Eyes large and prominent, reniform; a single row of long, stout setae behind the eyes. Clypeus deeply and broadly emarginate. Mandibles broad at apex, chisel-shaped. Antenna with the last four segments forming a club. Pronotum normal without prominent sculpturing; surface punctate, punctures close and coarse at margins, sparse and fine at center. Elytra with apices acute in female, truncate in male; entire surface moderately coarsely, uniformly punctate, punctures about twice as far apart as the diameter of the punctures; each elytron with three prominent longitudinal carinae, the external carina reaching slightly beyond the middle, the two internal carinae reaching almost to the apex. Scutellum large, shield-shaped. Legs normal; trochanters with a small tuft of long setae at the middle; tibia slightly curved; claws simple. Abdomen sparsely and finely punctate, clothed with sparse, long black hairs.

Color.—Metallic bluish green; thorax with narrow orange margins, the extent of which is variable, narrowing posteriorly and in some specimens reduced to an extremely narrow line posteriorly.

Female genitalia (fig. 4).—Proctiger longer than broad, apex evenly arcuate, base broadly emarginate; apex with a row of moderately long setae; setae on surface extending halfway to the base, much shorter than apical row. Paraprocts rectangular with a patch of long setae at apical lateral corner nearest proctiger. Valvifer without prominent lateral lobe; long setae present on apical margin. Coxite stout with apex acute and lateral margin beyond stylus bladelike. Inner side of blade of coxite with stout setae. Stylus stout, very slightly longer than coxite, apex with long setae.

Synonymical notes.—The characters by which Portevin (Encycl. Ent., vol. 6, p. 108, 1926) separates *O. viridis* from *O. coelestis* are too superficial to be acceptable as true specific differences. He states that there are differences in the pronotal punctation. In the former, the punctation is "plus rare et plus fine sur les espaces brillants" and in the latter "moins fortement ponctué, surtout à la base, avec des espaces discaux absolument lisses." In addition he illustrates color differences of the pronotum. In the material which was examined in this study, there were specimens fitting both descriptions, but with intergrades between the two. The genitalia of the series showed no differences. It is therefore my opinion that these

two are the same, and I place *Silpha coelestis* Dohrn, 1875, as a synonym of *Oiceoptoma viridis* Motschulsky, 1861.

Distribution.—This species, so far as present collecting has shown, occurs only in the Philippine Islands.

Specimens examined.—Fifty-nine: 31 ♂, 28 ♀. Mindanao, Davao Prov.: Mt. Apo (E. A. Mearns): 9 ♂, 6 ♀ [U.S.N.M.]; Baclayon, E. slope Mt. Apo, (elev. 6,500 ft.) Nov. 16, 1946 (H. Hoogstraal): 1 ♂, 1 ♀ [C.N.H.M., Philippine Zool. Exped. 1946-47]; Mainit, E. slope Mt. Apo (elev. 4,300 ft.) original forest, (H. Hoogstraal): 1 ♀ [C.N.H.M., Philippine Zool. Exped. (1946-47)]; E. slope Mt. McKinley (elev. 3,000 to 6,500) bird meat on ground, mossy forest (H. Hoogstraal): 7 ♂, 4 ♀ [C.N.H.M., Philippine Zool. Exped. (1946-47)]; Mt. Apo, (C. F. Clagg): Galog Riv. 1 ♂, 1 ♀, Mainit Riv. 6 ♂, 5 ♀, Seleban Riv. 6 ♂, 5 ♀ [C.N.H.M.]. Luzon: Mt. Irid, Rizal Pr. (F. Rivera): 1 ♂, 2 ♀; Mt. Alzapa, Casiguran, Tayaba Pr. (McGregor): 1 ♂, 1 ♀ [U.S.N.M.]. Cebú: Bugó: 1 ♀.

Diamesus Hope, 1840

The following is the only known species in this genus, and it is well known outside of the Philippine Islands.

There is a strong resemblance between this genus and the genus *Silpha* Linnaeus (= *Necrodes* Leach), and the female genitalia show this same relationship.

(2) **Diamesus osculans** (Vigors)

Necrodes osculans Vigors, 1825, Zool. Jour., vol. 1, p. 537, pl. 20, fig. 2 [type locality: "India Orientali"].

Diamesus osculans (Vigors); Hope, 1840, Col. Man., pt. 3, p. 149 [Madras, India]; Kraatz, 1876, Deut. Ent. Ztschr., vol. 20, p. 355 [no locality mentioned].

Necrodes osculans Vigors; Arrow, 1909, Ann. and Mag. Nat. Hist., ser. 8, vol. 4, p. 190 [S. India, Sarawaki, Woodlark Is., and Queensland].

Diamesus osculans ab. *bimaculatus* Portevin, 1914, Suppl. Ent., III, p. 6 [Formosa].

Diamesus osculans (Vigors); Portevin, 1922, Misc. Ent., vol. 26, p. 4 [description of an anomaly and of larvae, no locality mentioned]; 1926, Encycl. Ent., vol. 6, p. 170, 171, 174, fig. 132 [New Guinea to Ceylon, Borneo, Java, Sumatra, Indo-China, Bengal]; Hatch, 1928, Coleopterorum Cat., pars 95, p. 126 [Bengal, Ceylon to New Guinea, Borneo, Queensland, Woodlark Is., southern India].

Type.—The location of the type is unknown, but it is probably in the British Museum.

There is also a named form, *D. osculans* ab. *bimaculatus* Portevin, from Formosa which is distinguished by the lack of a basal orange band on the elytra and by having the apical band reduced to an apical, lateral orange spot. Otherwise

there are no perceivable differences between these specimens and those from elsewhere in the range of the species. There are three female *D. bimaculatus* "cotypes" from Formosa in the U. S. National Museum collection, without much doubt these are syntypes and they are so considered [U.S.N.M. Cat. No. 59310].

Diagnostic features.—Length 30-45 mm. Head rectangular. Eyes large; an abrupt constriction behind the eyes forming a broad neck. Labrum narrow, very broadly emarginate. Antennae clavate with the apical segment largest and pointed at the apex. Pronotum irregularly ovate. Elytra short, exposing four abdominal segments. Scutellum very large, over one-third the length of the elytra at the suture.

Sexual differences.—The surface of the male is very coarsely granular above, each granule tending to be pointed at the apex, especially towards the center of the pronotum and on the elytra. The upper surface of the female is quite different, being smooth with fine, sparse punctures. Moreover, the hind femora of the male are greatly enlarged; this is not true in the females.

Color.—Both sexes uniformly black except the apical three segments of the antennae which are orange, and two irregular reddish orange bands on the elytra, one subbasal and one subapical (except for the described form mentioned above).

Pubescence.—Surface beneath sparsely clothed with irregular length, fine yellow hair, densest and longest on the front coxae; a patch of stiff yellow hairs on the shoulders which narrows to a row along the upper ridge of the epipleural fold and extends to the apex of the elytra; scutellum with short, fine, sparse, yellow hairs.

Female genitalia (fig. 1).—Proetiger broadly V-shaped, with a large emarginate labrum-shaped lobe within the V. Paraproct triangular, narrowest near proetiger and each with a broad lateral flap. Valvifer and paraproct of a similar shape. Coxite short and broad, saddle-shaped, with a stout horn. Stylus large, stout, saddle-horn-shaped. Setae present as follows: apex of the proetiger; apex of the paraprocts near the proetiger; apex of the valvifer near the middle; apex of the coxite; and short, almost scalelike spicules at the apex of the styli.

Distribution.—This species is widely distributed in the Indo-Malayan area, extending into Australia. About 50 specimens have been studied of which only the following two females are from the Philippines: Luzon: Imngan, Nueva Vicaya (Baker); Cebu: Bugó [U.S.N.M.].

Nicrophorus Fabricius, 1775

Two species of *Nicrophorus* have been found on these islands. Both are closely related to *N. nepalensis* Hope, which is known from Central China, Northern India, Nepal, Sikkim, Bengal, Tonkin, Sumatra, Java, Borneo, and Flores.

(3) *Nicrophorus benguetensis* Arnett

Nicrophorus benguetensis Arnett, 1946, Proc. Ent. Soc. Wash., vol. 48, p. 207, fig. 1 [type locality: Baguio, P. I.].

Type.—♀; Baguio, Mountain Prov., Luzon Is., P. I., June 10, 1945 (J. G. Franclemont) [U.S.N.M. Cat. No. 59258]. The type, allotype, and four paratypes (all same data) have been deposited in the U. S. National Museum collection from the author's collection. One paratype (♂) has been deposited in the British Museum (Natural History) collection.

This species may be separated from the following new species by the presence of short yellow hairs which extend the length of the ridge of the epipleural fold. Also each elytron has two isolated black spots near the shoulder. The female genitalia differ in that the spatula of the proctiger process is narrower, the apex more evenly arcuate and the lobe of the lateral guide of the valvifer (fig. 6) narrower than in the following new species. (The entire female genitalia of this species as well as *N. nepalensis* Hope are figured with the original description.)

Additional material examined.—Two additional specimens of this species have been determined in the U. S. National Museum collection. They are both females labeled as follows: Baguio, Philippines (G. G. Haslam), and Baguio, Benguet (Baker) [ex C. F. Baker coll.]. The first agrees exactly with the type in color, size, and morphology. The specimen from the Baker collection is entirely black with the exception of the three terminal segments of the antennal club. However, I believe this color is largely due to grease stains, although attempts to degrease this specimen were unsuccessful. When examined in alcohol or xylene, the outlines of the normal orange bands on the elytra can be seen vaguely.

(4) *Nicrophorus apo*, new species

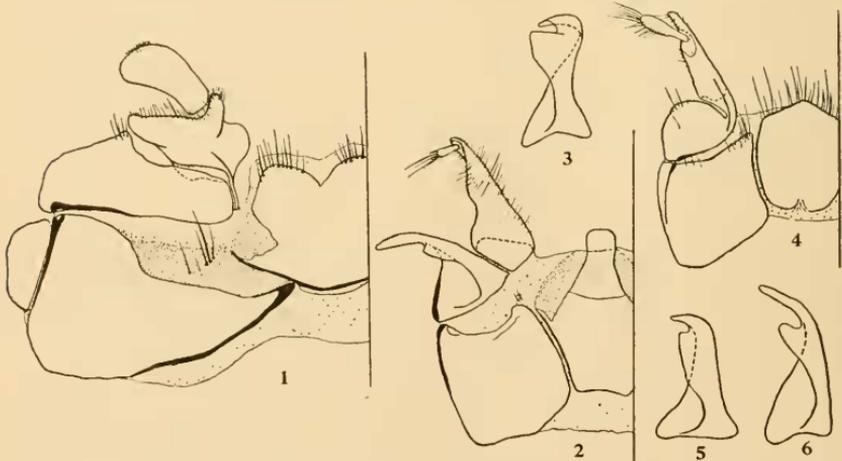
This species may be separated from the preceding and from *N. nepalensis* Hope (fig. 5) by the absence of a definite row of yellow hairs the length of the ridge of the epipleural fold, the lack of isolated black spots on the shoulders, the smaller size, the broader spatula of the proctiger process which is irregularly arcuate, and the broader lobe of the lateral guide of the valvifer (fig. 3). While these genitalic characters are relative to each other, a comparison of the two side by side leaves little doubt as to their specific differences, and the illustrations of the two should serve to separate them even when examples of only one species are at hand.

Type.—♀; Mt. Apo, Mindanao, June-July (E. A. Mearns) [U.S.N.M. Cat. No. 59259].

Diagnostic features: female.—Length 22 mm. Head sparsely and finely punctate, glabrous except for a patch of coarse, erect, moderately long bristles above and behind the eyes; labrum broadly and deeply emarginate; antennae sparsely covered with moderately short, fine, yellowish pubescence; neck with coarser and denser punctation than the front of the head. Pronotum oval, with very slight, barely noticeable lateral sinuations; surface with fine, sparse, short, yellow pubescence on the lateral margins; punctation fine and sparse. Metasternum covered with long, fine, yellow pubescence; surface nearly smooth. Trochanter spine of the hind legs moderate, slightly convergent. Elytra with surface moderately coarsely punctate; pubescence fine, somewhat coarser at the shoulders, but without a definite row of bristles; apex with a few "flying hairs." Metasternal epimeron tomentose, hairs yellow. Abdomen with both dorsal and ventral surfaces nearly smooth, covered with sparse, short, yellow hairs, except at sutures where there is a definite row of black bristles.

Color, black with the following reddish orange: apical three segments of the antennal club; a diamond-shaped spot between the eyes; entire epipleural fold to apex; each elytron with two spots, neither of which has an isolated black spot within. The elytral spots are well separated at the suture and the posterior ones are distinctly separated posteriorly and laterally. The anterior spots merge into the epipleural fold and at the sides project onto the shoulders.

Female genitalia (figs. 2 and 3).—Proctiger lobe moderately broad, without a ridge, with the apical spatula greatly curved dorsoventrally,



FEMALE GENITALIA (after dissection). Fig. 1, *Diamesus osculans* (Vigors); fig. 2, *Nicrophorus apo*, new species; fig. 3, *Nicrophorus apo*, New species; fig. 4, *Oiceoptoma* (*T.*) *viridis* Motschulsky; fig. 5, *Nicrophorus nepalensis* Hope; fig. 6, *Nicrophorus benguetensis* Arnett. Figs. 3, 5, and 6, valvifer turned to show lobe in broadest aspect.

without setae at the apex; paraprocts with only a slight apical ridge; lobe of the claw of the valvifer longer than broad (fig. 3); the portion of the claw beyond the lobe about one-third the length of the valvifer; coxite with the stylus terminal, one and one-half times as long as broad; external lateral margin of the coxite with a row of heavy setae extending less than one-half the length of the coxite.

Allotype.—♂; same data as type [U.S.N.M.].

Male.—Length: 18 mm. Agrees with the female in all respects except for secondary sexual differences.

Paratypes.—Fifty: 25 ♂, 25 ♀. Mindanao, Davao Prov.: Mt. Apo, June-July (E. A. Mearns): 1 ♂ [U.S.N.M.]; Galo Riv., Oct. 27, 1930 (elev. 6,000 ft.) (C. F. Clagg): 1 ♀ [C.N.H.M.]; From C.N.H.M. Philippine Zool. Exped.: Probably Mindanao Mts. (H. Hoogstraal): 1 ♀; Baclayan, E. slope Mt. Apo (elev. 6,500 ft.) original forest (H. Hoogstraal): 2 ♂, 1 ♀; Meran, E. slope Mt. Apo (elev. 6,000 ft.) original forest (H. Hoogstraal): 2 ♂, 1 ♀; E. slope Mt. McKinley (elev. 3,300-7,900 ft.) beating trees in stunted mossy forest, second growth forest, on ground, bird-meat bait, monkey carcass and meat-baited traps (H. Hoogstraal, F. Werner, D. Heyneman and G. Aleasid) Aug.-Nov.: 20 ♂, 21 ♀ [C.N.H.M.].

ALITOCORIS, A NEW GENUS OF PENTATOMIDAE

(HEMIPTERA)

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The new genus described below contains one previously named species and four new species. Cytological studies conducted at Columbia University under the direction of Professor Franz Schrader involve one of the unnamed species. This paper is written in order to provide a name for this species as well as some information concerning its affinities to related species of Pentatomidae.

The following generic diagnosis is presented in considerable detail in order to reduce duplication of descriptive information for the included species. It is expected that the discovery and inclusion of additional species will require alteration of some of the characteristics mentioned.

Alitocoris, new genus

Form broadly oval with greatest width across third visible abdominal segment; broadly rounded posteriorly and abruptly narrowed anteriorly from humeral angles to apex of head. Noticeably convex dorsally, strongly so ventrally. Anterior portion of pronotum and head moderately declivous.

Head broader across eyes than long; length about equal to width of